# COUNTING ROOM TECHNICIAN
# JOB PERFORMANCE MEASURE

**TASK CODE**: CRT-D03

**TASK**: Calibrate the Canberra 2404 Alpha/Beta Counting System

**NAME**: _____ **SSN**: _____

## REFERENCES:

1. WP 12-RL1300, Operation of Canberra 2404 Alpha/Beta Counting System
2. WP 12-RL1320, Radioactive Source Control

## TERMINAL OBJECTIVE:

Given a Canberra 2404 Alpha/Beta Counting System, calibrate the system per WP 12RL1300.

## CONSEQUENCES OF INADEQUATE PERFORMANCE:

Improper sample analysis
Component damage

## HAZARDS (PERSONNEL/EQUIPMENT STATUS):

None

## PRE-REQUISITE TRAINING/ TASK COMPLETION:

1. CF 3.00 Series
2. CRT-D02, Perform Proportional Counter Preoperational Checks
3. CRT-D05, Perform Gross Alpha/Beta Analysis with a Proportional Counter

**TOOLS/EQUIPMENT (MATERIALS REQUIRED)**:

1. Canberra Alpha/Beta Counting System
2. Radioactive Sources
3. System Logbook
4. Tweezers

**Instructions to Trainee**: You shall acquire the necessary references and equipment, and complete all required documentation. Knowledge requirements shall be completed with 80% or greater accuracy. Critical step performance shall be completed with 100% accuracy.

**Instructions to JPM Evaluator**: The trainee is to perform the terminal objective, without assistance, on the job site. Provide clarification of requirements if requested by the trainee. You are encouraged to ask relevant questions to verify trainee understanding. If the trainee fails this JPM, clearly document the reason for failure and forward to the trainee's manager. Successful completion of this JPM shall be recorded on the trainee's qualification card.

**KNOWLEDGE REQUIREMENTS**:

| Reference | Knowledge Requirement | Pass/Fail |
|---|---|---|
| 1 | State the purpose of a Plateau Program Calibration. | |
| 1 | State the purpose of a Window Program Calibration | |
| 1 | State the purpose of a Chi Square Program Calibration | |
| 2 | Discuss the precautions used when handling radioactive sources. | |
| 1 | Discuss how to manually determine the detector operating voltage. | |
| 1 | Describe the purpose of establishing a window setting. | |
| 1 | State the restrictions acssociated with the chi square value. | |

**PERFORMANCE REQUIREMENTS**:

| Reference | Performance Requirement | Pass/Fail |
|---|---|---|
| 1 | **Plateau Program Calibration** | |
| 2 | Obtain and checkout the required radioactive source.# | |
| 1 | Select options and perform the plateau.# | |
| 1 | Verify the computer selected high voltage setpoint is ± 50 volts of the distance from the knee of the curve to the end of the plateau when compared to manual calculation.# | |
| 1 | Generate, review and initial the printout report.# | |

| | | |
|---|---|---|
| 1 | Document the completion in the system logbook.# | |
| Reference | Performance Requirement | Pass/Fail |
| 1 | **Window Program Calibration** | |
| 2 | Obtain and checkout the required radioactive source.# | |
| 1 | Select options and perform the window setting.# | |
| 1 | Verify the computer selected window setting is at a point after curve drops to zero and ≤ 1% of beta counts are counted in alpha channel.# | |
| 1 | Generate, review and initial the printout report.# | |
| 1 | Document the completion in the system logbook.# | |
| 1 | **Chi Square Program Calibration** | |
| 2 | Obtain and checkout the required radioactive sources.# | |
| 1 | Select options and perform the chi square determination.# | |
| 1 | Verify the chi square is between 11 and 27.# | |
| 1 | Generate, review and initial the printout report.# | |
| 1 | Document the completion in the system logbook.# | |
| 2 | Remove and checkin the radioactive sources.# | |
| 1 | Place Calibration Sticker on equipment if all calibrations meet the acceptance criteria.# | |

# indicates a critical step

**FINAL EVALUATION**: PASS FAIL

**COMMENTS**:

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**EVALUATOR SIGNATURE**: _____ **DATE**:_____

**TRAINEE SIGNATURE**: _____ **DATE**:_____

**MANAGER SIGNATURE**: _____ **DATE**:_____